EXHIBIT A

City of Frisco
Water Conservation Plan

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APPENDICES

Water Conservation Plan for the

City of Frisco

October 2004

1. INTRODUCTION AND OBJECTIVES

Water supply has always been a key issue in the development of Texas. In recent years, the growing population and economic development of North Central Texas have led to increasing demands for water supplies. At the same time, local and less expensive sources of water supply are largely developed. Additional supplies to meet higher demands will be expensive and difficult to develop. It is therefore important that we make efficient use of our existing supplies and make them last as long as possible. This will delay the need for new supplies, minimize the environmental impacts associated with developing new supplies, and delay the high cost of additional water supply development.

Recognizing the need for efficient use of existing water supplies, the Texas Commission on Environmental Quality (TCEQ) has developed guidelines and requirements governing the development of water conservation plans for public water suppliers [1]. TCEQ guidelines and requirements are included in Appendix B. The North Texas Municipal Water District (NTMWD) has also developed this water conservation plan for its member cities and customers following TCEQ guidelines and requirements.

The objectives of this water conservation plan are as follows:

- To reduce water consumption from the levels that would prevail without conservation efforts.
- To reduce the loss and waste of water.
- To improve efficiency in the use of water.
- To document the level of recycling and reuse in the water supply.
- To extend the life of current water supplies by reducing the rate of growth in demand.

In order to adopt this plan, NTMWD requires the City of Frisco to do the following:

- Complete the water utility profile (provided in Appendix C).
- Set five- and ten-year goals for per capita water use.
- Adopt ordinance(s) or regulation(s) approving the plan.

[1] Superscripted numbers match references listed in Appendix A.

The water utility profile, goals, and ordinance(s) or regulations should be provided to NTMWD in draft form for review and comments. Final adopted versions should also be provided to NTMWD.

This plan includes all of the elements required by TCEQ. Some elements of this plan go beyond TCEQ requirements, and member cities and customers can be flexible in their implementation. The following elements are included in the water conservation plan:

- Landscape Water Management Plan (Appendix E)
- The goal for unaccounted water is 12%.

2. TEXAS COMMISSION ON ENVIRONMENTAL QUALITY RULES

The TCEQ rules governing development of water conservation plans for public water suppliers are contained in Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2 of the Texas Administrative Code, which is included in Appendix B. For the purpose of these rules, a water conservation plan is defined as "A strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water [1]." The elements in the TCEQ water conservation rules covered in this conservation plan are listed below.

Minimum Conservation Plan Requirements

The minimum requirements in the Texas Administrative Code for Water Conservation Plans for Public Water Suppliers are covered in this report as follows:

- 288.2(a)(1)(A) – Utility Profile – Section 3 and Appendix C
- 288.2(a)(1)(B) – Specification of Goals – Section 4
- 288.2(a)(1)(C) – Accurate Metering – Sections 5.1 and 5.2
- 288.2(a)(1)(D) – Universal Metering – Section 5.2
- 288.2(a)(1)(E) – Determination and Control of Unaccounted Water – Section 5.4
- 288.2(a)(1)(F) – Public Education and Information Program – Section 6
- 288.2(a)(1)(G) – Non-Promotional Water Rate Structure – Section 7
- 288.2(a)(1)(H) – Reservoir System Operation Plan – Section 8.1
- 288.2(a)(1)(I) – Means of Implementation and Enforcement – Section 9
- 288.2(a)(1)(J) – Coordination with Regional Water Planning Group – Section 8.6 and Appendix F

Conservation Additional Requirements (Population over 5,000)

The Texas Administrative Code includes additional requirements for water conservation plans for cities with a population over 5,000:

- 288.2(a)(2)(A) – Leak Detection, Repair, and Water Loss Accounting – Sections 5.4, 5.5, and 5.6
- 288.2(a)(2)(B) – Record Management System – Section 5.3
- 288.2(a)(2)(C) – Requirement for Water Conservation Plans by Wholesale Customers – Section 8.5

Additional Conservation Strategies

TCEQ rules also list additional optional but not required conservation strategies, which may be adopted by suppliers. The following optional strategies are included in this plan:

- 288.2(a)(3)(A) – Conservation Oriented Water Rates – Section 7
- 288.2(a)(3)(B) – Ordinances, Plumbing Codes or Rules on Water-Conserving Fixtures – Section 8.3
- 288.2(a)(3)(D) – Reuse and Recycling of Wastewater – Section 8.2
- 288.2(a)(3)(F) – Considerations for Landscape Water Management Regulations – Section 8.4 and Appendix E
- 288.2(a)(3)(G) – Monitoring Method – Section 5.6

3. WATER UTILITY PROFILE

Appendix C to this water conservation plan is the water utility profile based on the format recommended by the TCEQ. In adopting this water conservation plan, the City of Frisco will provide a draft water utility profile to NTMWD for review and comment. A final water utility profile will be provided to NTMWD.

4. SPECIFICATION OF WATER CONSERVATION GOALS

Current TCEQ rules require the adoption of specific water conservation goals for a water conservation plan. As part of plan adoption, each member city and customer will develop 5-year and 10-year goals for per capita municipal use, following TCEQ procedures described in the water utility profile (Appendix C). These goals should be submitted to NTMWD in draft form for review. The goals for this water conservation plan include the following:

- Keep the per capita municipal water use below the specified amount in gallons per capita per day in a dry year, to be shown on the completed Table C-1 (5-year and 10-year goals).
- Keep the level of unaccounted water in the system below 12% annually in 2008 and subsequent years, as discussed in Section 5.4.
- Implement and maintain a program of universal metering and meter replacement and repair, as discussed in Section 5.2.
- Decrease waste in lawn irrigation by implementation and enforcement of landscape water management regulations, see Appendix E.
- Raise public awareness of water conservation and encourage responsible public behavior by a public education and information program, as discussed in Section 6.
- Develop a system specific strategy to conserve water during peak demands, thereby reducing the peak use.

5. METERING, WATER USE RECORDS, CONTROL OF UNACCOUNTED WATER, AND LEAK DETECTION AND REPAIR

One of the key elements in water conservation is careful tracking of water use and control of losses through illegal diversions and leaks. Careful metering of water deliveries and water use, detection and repair of leaks in the distribution system and regular monitoring of unaccounted water are important in controlling losses.

5.1 Accurate Metering of Treated Water Deliveries from NTMWD

NTMWD supplies all of the water used by its member cities and customers. Water deliveries are metered by NTMWD using meters with accuracy of ±2%. These meters are calibrated on a monthly basis by NTMWD to maintain the required accuracy.

5.2 Metering of Customer and Public Uses and Meter Testing, Repair, and Replacement

All customers of member cities and customers, including public and governmental users, should be metered. In many cases, member cities and customers already meter all of their water users. For those member cities and customers who do not currently meter all of their water uses, these entities will implement a program to meter all water uses within the next three years.

Most member cities and customers test and replace their customer meters on a regular basis. All customer meters should be replaced on a 15-year cycle. Those who do not currently have a meter testing and replacement program will implement such a program over the next three years.

5.3 Record Management System

As required by TAC Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2(a)(2)(B), the record management system allows for the separation of water sales and uses into residential, commercial, public/institutional, and industrial categories. This information will be included in an annual water conservation report, as described in Section 5.6 below.

For those entities whose record management systems do not currently allow for the separation of water sales as described above, they will move to implement such a system within the next five years.

5.4 Determination and Control of Unaccounted Water

Unaccounted water is the difference between water delivered to member cities and customers from NTMWD and metered deliveries to customers plus authorized but unmetered uses. (Authorized but unmetered uses would include use for fire fighting, releases for flushing of lines, and uses associated with new construction.) Unaccounted water can include several categories:

- Inaccuracies in customer meters. (Customer meters tend to run more slowly as they age and under-report actual use.)
- Accounts which are being used but have not yet been added to the billing system.
- Losses due to water main breaks and leaks in the water distribution system.
- Losses due to illegal connections and theft. (Illegal Water Connections and Theft of Water Ordinance)
- Other.

Measures to control unaccounted water are part of the routine operations of member cities and customers. Maintenance crews and personnel are asked to look for and report evidence of leaks in the water distribution system. The leak detection and repair program is described in Section 5.5 below. Meter readers are asked to watch for and report signs of illegal connections, so they can be addressed quickly.

Unaccounted water is to be calculated in Appendix C. With the measures described in this plan, member cities and customers intend to maintain the unaccounted water below 12% in 2008 and subsequent years. If unaccounted water exceeds this goal, the member city or customer will implement a more intensive audit to determine the source(s) of and reduce the unaccounted water. The annual conservation report described below is the primary tool used to monitor unaccounted water.

5.5 Leak Detection and Repair

As described above, city crews and personnel are asked to look for and report evidence of leaks in the water distribution system. Areas of the water distribution system in which numerous leaks and line breaks occur are targeted for replacement as funds are available.

5.6 Monitoring of Effectiveness and Efficiency - Annual Water Conservation Report

Appendix D is a form that will be used in the development of an annual water conservation report for member cities and customers. This form will be completed by March 31 of the following year and will be used to monitor the effectiveness and efficiency of the water conservation program and to plan conservation-related activities for the next year. The form records the water use by category, per capita municipal use, and unaccounted water for the current year and compares them to historical values. The annual water conservation report will also be sent to NTMWD, which will monitor regional water conservation trends.

6. CONTINUING PUBLIC EDUCATION AND INFORMATION CAMPAIGN

The continuing public education and information campaign on water conservation includes the following elements:

- Insert water conservation information with water bills. Inserts will include material developed by member cities' and customers' staff and material obtained from the TWDB, the TCEQ, and other sources.
- Encourage local media coverage of water conservation issues and the importance of water conservation.
- Notify local organizations, schools, homeowner's associations and civic groups that the City of Frisco and staff of the NTMWD are available to make presentations on the importance of water conservation and ways to save water.
- Leadership Frisco Class VI purchased a robot, Professor WaterWise, that is now available through City Staff for children's presentations and helped develop WaterWise Class 101 which is offered twice a year for adult education.
- Make *Texas Smartscape* information and other water conservation materials available to the public at City Hall and other public places.
- Make information on water conservation available on the City of Frisco web site and include links to the *Texas Smartscape* website and to information on water conservation on the TWDB and TCEQ web sites.

As a regional water supplier, the NTMWD has made the "Learning to Be Water Wise" educational materials for 5th grade students available to local school districts. This program contains individual kits and activities to educate students on the importance of water and water conservation activities in the community and in their homes.

7. WATER RATE STRUCTURE

Member cities and customers will adopt, if they have not already done so, an increasing block rate water structure that is intended to encourage water conservation and discourage excessive use and waste of water upon completion of the next rate study or within five years. An example water rate structure is as follows:

Residential Rates

1. Monthly minimum charge. This can (but does not have to) include up to 2,000 gallons water use with no additional charge.
2. Base charge per 1,000 gallons up to the approximate average residential use.
3. 2nd tier (from the average to 2 times the approximate average) at 1.25 to 2.0 times the base charge.
4. 3rd tier (above 2 times the approximate average) at 1.25 to 2.0 times the 2nd tier.
5. The residential rate can also include a lower tier for basic household use up to 4,000 gallons per month or so.

Commercial/Industrial Rates

Commercial/industrial rates should include at least 2 tiers, with rates for the 2nd tier at 1.25 to 2.0 times the first tier. Higher water rates for commercial irrigation use are encouraged, but not required.

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8. OTHER WATER CONSERVATION MEASURES

8.1 NTMWD Reservoir System Operation Plan

Member cities and customers of NTMWD purchase treated water from NTMWD and do not have surface water supplies for which to implement a reservoir system operation plan. NTMWD's permits do allow some coordinated operation of its reservoirs, and NTMWD is seeking additional water rights for coordinated operation to optimize its available water supplies.

8.2 Reuse and Recycling of Wastewater

Most member cities and customers do not own and operate their own wastewater treatment plants. Their wastewater is treated by NTMWD. NTMWD currently has the largest wastewater reuse program in the state. NTMWD has water rights allowing reuse of up to 35,941 acre-feet per year of treated wastewater for municipal purposes, which provides about 13 percent of NTMWD's total water supply. NTMWD is currently seeking a permit that would double its permitted reuse and is also considering additional reuse projects to increase this supply further. NTMWD also makes treated wastewater from its plants available for direct reuse for landscape irrigation and industrial use.

For those member cities and customers who do own and operate their own wastewater treatment plants, they will move toward reusing treated effluent for irrigation purposes around their plants over the next three years. These entities will also seek other alternatives for reuse of recycled wastewater.

8.3 Ordinances, Plumbing Codes, or Rules on Water-Conserving Fixtures

The State of Texas has required water-conserving fixtures in new construction and renovations since 1992. The state standards call for flows of no more than 2.5 gallons per minute (gpm) for faucets, 3.0 gpm for showerheads, and 1.6 gallons per flush for toilets. Similar standards are now required nationally under federal law. These state and federal standards assure that all new construction and renovations will use water-conserving fixtures.

8.4 Landscape Water Management Regulations

Appendix E is a summary of landscape water management regulations adopted as part of this water conservation plan. These regulations are intended to minimize waste in landscape irrigation.

8.5 Additional Water Conservation Incentive Programs (Voluntary):

The City of Frisco will consider adopting additional water conservation programs included but not limited to:

- Low-flow toilet replacement and rebate programs,
- Pressure reduction in the system or for individual customers,

- Rebates for rain/freeze sensors,
- Low-flow showerhead and sink aerators replacement programs, or
- Other water conservation incentive programs.

8.6 Requirement for Water Conservation Plans by Wholesale Customers

Every contract for the wholesale sale of water by member cities and/or customers that is entered into, renewed, or extended after the adoption of this water conservation and drought contingency plan will include a requirement that the wholesale customer and any wholesale customers of that wholesale customer develop and implement a water conservation plan meeting the requirements of Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2 of the Texas Administrative Code. The requirement will also extend to each successive wholesale customer in the resale of the water.

8.7 Coordination with Regional Water Planning Group and NTMWD

The City of Frisco will send a copy of their draft ordinance(s) or regulation(s) implementing the plan and their water utility profile to NTMWD for review and comment. The adopted ordinance(s) or regulation(s) and the adopted water utility profile will also be sent to NTMWD.

9. IMPLEMENTATION AND ENFORCEMENT OF THE WATER CONSERVATION PLAN

The Water Conservation Plan Ordinance includes the implementation and enforcement of the plan including designation of responsible officials to implement and enforce the water conservation plan. Appendix E, the landscape water management regulations, also includes information about enforcement. The City of Frisco is adopting an ordinance related to illegal connections and water theft.

APPENDIX A

LIST OF REFERENCES

Appendix A
List of References

(1) Title 30 of the Texas Administrative Code, Part 1, Chapter 288, Subchapter A, Rules 288.1 and 288.2, and Subchapter B, Rule 288.20, downloaded from http://www.tnrcc.state.tx.us/oprd/rules/pdflib/288a.pdf, November 2003.

(2) Freese and Nichols, Inc.: *North Texas Municipal Water District Water Conservation and Drought Management Plan,* prepared for the North Texas Municipal Water District, Fort Worth, February 2003.

(3) Edward Motley, Marisa Vergara, Tom Gooch, and Stephanie Griffin: Memorandum to File on "Region C Municipal Water Use Projections Adopted on August 18, 2003," Fort Worth, August 21, 2003.

The following conservation and drought contingency plans and related documents were reviewed in the development of this plan. References marked with a * were used heavily in the development of this plan.

(4) City of Austin Water Conservation Division: "City of Austin Water Drought Contingency Plan, Developed to Meet Senate Bill 1 Regulatory Requirements," Austin, August 1999.

(5) City of Austin Water Conservation Division: "City of Austin Water Conservation Plan, Developed to Meet Senate Bill 1 Regulatory Requirements," Austin, August 1999.

(6) Upper Trinity Regional Water District: "Water Conservation Plan and Emergency Water Demand Management Plan," adopted by the Board of Directors, Lewisville, August 5, 1999.

(7) Upper Trinity Regional Water District: "Water Conservation Plan and Emergency Water Demand Management Plan (2002 Amended)," adopted by the Board of Directors, Lewisville, February 2002.

(8) *City of Dallas Water Utilities Department: "City of Dallas Water Management Plan," adopted by the City Council, Dallas, September 1999.

(9) Updates to City of Dallas Water Management Plan found at http://www.dallascityhall.com in September 2003.

(10) *City of Dallas Water Utilities Department: "City of Dallas Water Conservation Plan," adopted by the City Council, Dallas, September 1999.

(11) *City of Fort Worth: "Water Conservation plan for the City of Fort Worth," Fort Worth, August 1999.

(12) Updates to the City of Fort Worth water conservation plan found at http://ci./fort-worth.tx.us in September 2003.

(13) *City of Fort Worth: "Emergency Water Management Plan for the City of Fort Worth," Fort Worth, August 19, 2003.

(14) HDR Engineering, Inc.: "Water Conservation and Emergency Demand Management Plan," prepared for the Tarrant Regional Water District, Austin, February 2000.

(15) Freese and Nichols, Inc.: "Water Conservation and Drought Contingency Plan," prepared for Brown County Water Improvement District No. 1, Fort Worth, August 1999.

(16) Freese and Nichols, Inc.: "Water Conservation and Drought Contingency Plan," prepared for the Sabine River Authority of Texas, Fort Worth, September 1994.

(17) HDR Engineering, Inc.: "Water Conservation and Emergency Demand Management Plan," prepared for the Tarrant Regional Water District, Austin, June 1998.

(18) HDR Engineering, Inc.: "Water Conservation Plan for the City of Corpus Christi," adopted by the City of Corpus Christi City Council, August 24, 1999.

(19) City of Houston's water conservation plan downloaded September 2003 from http://www.cityofhouston.gov

(20) City of Houston: "Ordinance N. 2001-753, Amending Chapter 47 of the Code of Ordinances Relating to Water Emergencies," Houston, August 2001.

(21) City of Houston: "Ordinance No. 98-764, Relating to Water Conservation," Houston, September 1998.

(22) City of Houston: "Water Conservation Plan," 1998.

(23) City of Houston: "Water Emergency Response Plan," Houston, July 15, 1998.

(24) City of Lubbock: "Water Conservation Plan," ordinance number 10177 adopted by the City Council in August 1999.

(25) City of El Paso Water Conservation Ordinance downloaded August 14, 2003 from http://www.epwu.org/ordinance.html

(26) San Antonio Water System: "Water Conservation and Reuse Plan," San Antonio, November 1998 with June 2002 updates.

(27) North Texas Municipal Water District: "District Policy No. 24 Water Conservation Plan Containing Drought Contingency Plan," adopted August 1999.

(28) GDS Associates, Inc.: "Water Conservation Study," prepared for the Texas Water Development Board, Fort Worth, 2002.

(29) A & N Technical Services, Inc.: "BMP Costs & Savings Study: A Guide to Data and Methods for Cost-Effectiveness Analysis of Urban Water Conservation Best Management Practices," prepared for The California Urban Water Conservation Council, Santa Monica, California, July 2000.

(30) *City of Dallas: "City of Dallas Ordinances, Chapter 49, Section 21.1," Dallas, October 1, 2001.

APPENDIX B

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY RULES ON MUNICIPAL WATER CONSERVATION PLANS

APPENDIX B
Texas Commission on Environmental Quality Rules on Water Conservation Plans

Texas Administrative Code

TITLE 30	ENVIRONMENTAL QUALITY
PART 1	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
CHAPTER 288	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
SUBCHAPTER A	WATER CONSERVATION PLANS
RULE §288.1	**Definitions**

The following words and terms, when used in this chapter, shall have the following meanings, unless the context clearly indicates otherwise.

(1) Agricultural or Agriculture--means any of the following activities:

(A) cultivating the soil to produce crops for human food, animal feed, or planting seed or for the production of fibers;

(B) the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or non-soil media by a nursery grower;

(C) raising, feeding, or keeping animals for breeding purposes or for the production of food or fiber, leather, pelts, or other tangible products having a commercial value;

(D) raising or keeping equine animals;

(E) wildlife management; and

(F) planting cover crops, including cover crops cultivated for transplantation, or leaving land idle for the purpose of participating in any governmental program or normal crop or livestock rotation procedure.

(2) Agricultural use--Any use or activity involving agriculture, including irrigation.

(3) Conservation--Those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling and reuse of water so that a water supply is made available for future or alternative uses.

(4) Drought contingency plan--A strategy or combination of strategies for temporary supply and demand management responses to temporary and potentially recurring water supply shortages and other water supply emergencies. A drought contingency plan may be a separate document identified as such or may be contained within another water management document(s).

(5) Industrial use--The use of water in processes designed to convert materials of a lower

order of value into forms having greater usability and commercial value, commercial fish production, and the development of power by means other than hydroelectric, but does not include agricultural use.

(6) Irrigation--The agricultural use of water for the irrigation of crops, trees, and pastureland, including, but not limited to, golf courses and parks which do not receive water through a municipal distribution system.

(7) Irrigation water use efficiency--The percentage of that amount of irrigation water which is beneficially used by agriculture crops or other vegetation relative to the amount of water diverted from the source(s) of supply. Beneficial uses of water for irrigation purposes include, but are not limited to, evapotranspiration needs for vegetative maintenance and growth, salinity management, and leaching requirements associated with irrigation.

(8) Mining use--The use of water for mining processes including hydraulic use, drilling, washing sand and gravel, and oil field repressuring.

(9) Municipal per capita water use--The sum total of water diverted into a water supply system for residential, commercial, and public and institutional uses divided by actual population served.

(10) Municipal use--The use of potable water within or outside a municipality and its environs whether supplied by a person, privately owned utility, political subdivision, or other entity as well as the use of sewage effluent for certain purposes, including the use of treated water for domestic purposes, fighting fires, sprinkling streets, flushing sewers and drains, watering parks and parkways, and recreational purposes, including public and private swimming pools, the use of potable water in industrial and commercial enterprises supplied by a municipal distribution system without special construction to meet its demands, and for the watering of lawns and family gardens.

(11) Nursery grower--A person engaged in the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or nonsoil media, who grows more than 50% of the products that the person either sells or leases, regardless of the variety sold, leased, or grown. For the purpose of this definition, grow means the actual cultivation or propagation of the product beyond the mere holding or maintaining of the item prior to sale or lease, and typically includes activities associated with the production or multiplying of stock such as the development of new plants from cuttings, grafts, plugs, or seedlings.

(12) Pollution--The alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water in the state that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property, or to the public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.

(13) Public Water Supplier--An individual or entity that supplies water to the public for human consumption.

(14) Regional Water Planning Group--A group established by the Texas Water

Development Board to prepare a regional water plan under Texas Water Code, §16.053.

(15) Retail Public Water Supplier--An individual or entity that for compensation supplies water to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants when that water is not resold to or used by others.

(16) Reuse--The authorized use for one or more beneficial purposes of use of water that remains unconsumed after the water is used for the original purpose of use and before that water is either disposed of or discharged or otherwise allowed to flow into a watercourse, lake, or other body of state-owned water.

(17) Water conservation plan--A strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water. A water conservation plan may be a separate document identified as such or may be contained within another water management document(s).

(18) Wholesale Public Water Supplier--An individual or entity that for compensation supplies water to another for resale to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants as an incident of that employee service or tenancy when that water is not resold to or used by others, or an individual or entity that conveys water to another individual or entity, but does not own the right to the water which is conveyed, whether or not for a delivery fee.

Source Note: The provisions of this §288.1 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective August 15, 2002, 27 TexReg 7146

Texas Administrative Code

TITLE 30	ENVIRONMENTAL QUALITY
PART 1	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
CHAPTER 288	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
SUBCHAPTER A	WATER CONSERVATION PLANS
RULE §288.2	**Water Conservation Plans for Municipal Uses by Public Water Suppliers**

(a) A water conservation plan for municipal water use by public water suppliers shall provide information, where applicable, in response to the following.

(1) Minimum requirements. All water conservation plans for municipal uses by public drinking water suppliers shall include the following elements:

(A) a utility profile including, but not limited to, information regarding population and customer data, water use data, water supply system data, and wastewater system data;

(B) specification of conservation goals including, but not limited to, municipal per capita water use goals, the basis for the development of such goals, and a time frame for achieving the specified goals;

(C) metering device(s), within an accuracy of plus or minus 5.0% in order to measure and account for the amount of water diverted from the source of supply;

(D) a program for universal metering of both customer and public uses of water, for meter testing and repair, and for periodic meter replacement;

(E) measures to determine and control unaccounted-for uses of water (for example, periodic visual inspections along distribution lines; annual or monthly audit of the water system to determine illegal connections, abandoned services, etc.);

(F) a program of continuing public education and information regarding water conservation;

(G) a water rate structure which is not "promotional," i.e., a rate structure which is cost-based and which does not encourage the excessive use of water;

(H) a reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin in order to optimize available water supplies; and

(I) a means of implementation and enforcement which shall be evidenced by:

(i) a copy of the ordinance, resolution, or tariff, indicating official adoption of the water conservation plan by the water supplier; and

(ii) a description of the authority by which the water supplier will implement and enforce the conservation plan; and

(J) documentation of coordination with the Regional Water Planning Groups for the service area of the public water supplier in order to insure consistency with the appropriate approved regional water plans.

(2) Additional content requirements. Water conservation plans for municipal uses by public drinking water suppliers serving a current population of 5,000 or more and/or a projected population of 5,000 or more within the next ten years subsequent to the effective date of the plan shall include the following elements:

(A) a program of leak detection, repair, and water loss accounting for the water transmission, delivery, and distribution system in order to control unaccounted-for uses of water;

(B) a record management system to record water pumped, water deliveries, water sales, and water losses which allows for the desegregation of water sales and uses into the following user classes:

(i) residential;

(ii) commercial;

(iii) public and institutional; and

(iv) industrial; and

(C) a requirement in every wholesale water supply contract entered into or renewed after official adoption of the plan (by either ordinance, resolution, or tariff), and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements in this chapter; if the customer intends to resell the water, then the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with applicable provisions of this chapter.

(3) Additional conservation strategies. Any combination of the following strategies shall be selected by the water supplier, in addition to the minimum requirements in paragraphs (1) and (2) of this subsection, if they are necessary to achieve the stated water conservation goals of the plan. The commission may require that any of the following strategies be implemented by the water supplier if the commission determines that the strategy is necessary to achieve the goals of the water conservation plan:

(A) conservation-oriented water rates and water rate structures such as uniform or increasing block rate schedules, and/or seasonal rates, but not flat rate or decreasing block rates;

(B) adoption of ordinances, plumbing codes, and/or rules requiring water-

conserving plumbing fixtures to be installed in new structures and existing structures undergoing substantial modification or addition;

(C) a program for the replacement or retrofit of water-conserving plumbing fixtures in existing structures;

(D) reuse and/or recycling of wastewater and/or greywater;

(E) a program for pressure control and/or reduction in the distribution system and/or for customer connections;

(F) a program and/or ordinance(s) for landscape water management;

(G) a method for monitoring the effectiveness and efficiency of the water conservation plan; and

(H) any other water conservation practice, method, or technique which the water supplier shows to be appropriate for achieving the stated goal or goals of the water conservation plan.

(b) A water conservation plan prepared in accordance with 31 TAC §363.15 (relating to Required Water Conservation Plan) of the Texas Water Development Board and substantially meeting the requirements of this section and other applicable commission rules may be submitted to meet application requirements pursuant to a memorandum of understanding between the commission and the Texas Water Development Board.

Source Note: The provisions of this §288.2 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544

APPENDIX C

WATER UTILITY PROFILE

APPENDIX C
Water Utility Profile Based on TCEQ Format

The purpose of the Water Utility Profile is to assist an applicant with water conservation plan development and to ensure that important information and data be considered when preparing your water conservation plan and goals. You may contact the Municipal Water Conservation Unit of the TWDB at 512-936-2391 for assistance, or the Resource Protection Team at 512-239-4691 if submitted to the TCEQ. You may also contact Denise Hickey of NTMWD at 972/442-5405 or Tom Gooch of Freese and Nichols at 817/735-7300.

Name of Utility:	City of Frisco
Address & Zip:	11300 Research Rd. Frisco, TX 75034
Telephone Number:	972-335-5520
Fax Number:	972-335-5524
Form Completed by:	Jody Purvis
Title:	Water Education Coordinator
Signature:	_____
Date:	_____

Name and phone number of person/department responsible for implementing a water conservation program:
Name: Gary Hartwell, Director of Public Works or Jody Purvis, Water Education Coordinator
Phone Number: 972-335-5520

I. CUSTOMER DATA

A. Population and Service Area Data

1. Please attach a copy of your Certificate of Convenience and Necessity (CCN) from the TCEQ, and a service-area map.
2. Service area size (square miles): 70
3. Current population of service area: 72,000 as of year 2004
4. Current population served by utility:
   water: 72000
   wastewater: 71850
5. Miles of Water Distribution Pipeline: 470

6. Population served by utility for the previous five years. (Please list by year in ascending order.):

Year	Population
2003	55,400
2002	50,550
2001	42,511
2000	33,714
1999	26,200

7. Projected population for service area in the following decades:

Year	Population
2010	111,050
2020	200,000
2030	244,000
2040	269,000
2050	290,000
2060	300,000

8. List source(s)/method(s) for the calculation of current and projected population:
   Figures were obtained from the City of Frisco's Planning Department and from the NTMWD Population Projections Worksheet.

B. Active Connections

1. Current number of active connections by user type:
   Multi-family service is counted as Other
   Current year is: 2004

Treated Water Users	Metered	Non-Metered	Total
Residential	21,859	0	21,859
Commercial	1,322	0	1,322
Industrial	13	0	13
Public	139	0	139
Other	2,629	0	2,629
Total	25,962	0	25,962

2. List the net number of new connections per year for most recent three years:

Year	2001	2002	2003
Residential	8,216	3,321	4,321
Commercial	527	185	208
Industrial	2	8	1
Public	13	15	12
Other	398	191	196
Total	9,156	3,720	4,738

C. High Volume Customers

List annual water use for the five highest volume retail and wholesale customers. (Please indicate if treated or raw water delivery.):

Customer	Use (1,000 gal/yr)	Treated/ Raw Water
FISD	87,960	Treated
Stonebriar Centre	54,060	Treated
Exide Technologies	40,629	Treated
P.C. Dynamics	8,645	Treated
Hutson Industries	7,426	Treated

II. WATER USE DATA FOR SERVICE AREA

A. Water Accounting Data

1. Amount of water use for previous five years (in 1,000 gal):

Please indicate: Diverted Water ___

Treated Water X (supplied from NTMWD)

Year	1999	2000	2001	2002	2003
January	122,600	166,000	173,700	218,800	291,600
February	118,700	164,500	152,900	220,400	234,300
March	143,400	167,000	176,400	260,500	331,000
April	171,200	215,500	268,600	318,900	459,500
May	188,700	287,000	384,000	388,000	555,600
June	240,000	268,100	470,000	544,300	562,900
July	332,900	494,500	585,500	569,900	822,100
August	426,300	592,400	607,900	740,000	861,400
September	344,400	534,400	381,100	594,900	552,500
October	327,400	345,900	418,400	420,800	545,100
November	250,000	208,300	337,800	348,900	360,000
December	173,700	180,200	285,000	301,400	336,000
Total	2,839,300	3,623,800	4,241,300	4,926,800	5,912,000

The water use from the previous five years was based on a maser meter at the point of delivery.

2. Metered amount of water (in 1,000 gallons) delivered (sold) as recorded by the following account types (See #1, Appendix C1) for the past five years.:

Year	Residential	Commercial	Industrial	Wholesale	Other	Total Sold
2003	3,128,600	2,269,464	56,709	457,227		5,912,000
2002	2,401,700	2,230,499	46,463	248,138		4,926,800
2001	2,517,400	1,536,367	52,347	135,186		4,241,300
2000	2,116,400	1,437,599	52,718	33,794		3,640,511
1999	1,650,056	1,135,720	53,524	0		2,839,300

3. List previous five years records for unaccounted-for water use in million gallons (See #2, Appendix C1) Data is calculated in Appendix D.

Unaccounted Water	Year				
	1999	2000	2001	2002	2003
NTMWD Deliveries	2777.8	3603.4	4194.0	4926.8	5912.0
Other Supplies	61.5	20.4	47.3	0	0
Total Sales	2433.3	3192.6	3541.5	4294.0	4908.9
Estimated Fire Use	1.2	1.5	1.7	1.9	2.5
Estimated line flushing	19.7	22.4	26.6	29.8	35.2
Unaccounted Water	385.1	407.3	671.5	601.1	965.4
% Unaccounted	13.60%	11.20%	15.80%	12.20%	16.30%
Goal for % Unaccounted	12.00%	12.00%	12.00%	12.00%	12.00%

4. List previous five years records for annual peak-to-average daily use ratio (See #3, Appendix C1):

Year	Average MGD	Peak MGD	Ratio
2003	16	35	2.19
2002	14	28	2.10
2001	12	25	2.13
2000	10	22	2.21
1999	8	17	2.17

5. Municipal per capita water use for previous five years (See #4, Appendix C1):

Year	Population	Total Diverted (or Treated) (1,000 gal)	Industrial Sales (1,000 gal)	Wholesale Sales (1,000 gal)	In-City Municipal Use (1,000 gal)	Municipal per Capita Use (gpcd)
2003	55,400	6,369,227	56,709	457,227	5,855,291	289.00
2002	50,550	5,174,938	46,463	248,138	4,880,337	264.00
2001	42,511	4,376,486	52,347	135,186	4,188,953	269.00
2000	33,714	3,657,594	52,718	33,794	3,571,082	290.00
1999	26,200	2,839,300	53,524	0	2,785,776	291.00

Year	Single Family Use (1,000 gal)	Multi-Family Use (1,000 gal)	Residential Use (1,000 gal)	Residential per Capita Use (gpcd)
2003	2,996,400	132,200	3,128,600	155
2002	2,289,700	112,000	2,401,700	130
2001	2,412,600	104,800	2,517,400	162
2000	2,075,000	41,400	2,116,400	172
1999	data not available		1,650,056	173

6. Seasonal water use for the previous five years (in gallons/person/day) (See #5, Appendix C1)
   Note: The December value must be entered into #5 Appendix C1 to calculate the base per capita correctly for the first year entry.

Year	Population	Base per Capita Use (gpcd)	Summer per Capita Use (gpcd)	Seasonal Use (gpcd)	Portion of Average Annual Use Attributed to Seasonal Use (GPCD)
1999	26,200	154	424	270	68
2000	33,714	166	447	281	71
2001	42,511	132	435	303	76
2002	50,550	159	408	249	63
2003	55,400	166	451	285	72

Note: Seasonal per capita use is calculated by subtracting the base per capita use from the summer per capita use.

B. Projected Water Demands

Provide estimates for total water demands for the planning horizon of the utility. Indicate sources of data and how projected water demands were determined.

Year	Projected Demand (Ac-Ft)	Source of data	Explanation of the Methodology Used to Develop Projection
2060	99,441	Current usage data from master water meter at point of delivery	Anticipated in 2005 Frisco will no longer have any wholesale customers as Little Elm and Prosper will have direct connections to NTMWD. The current industrial uses in Frisco have maintained a relatively constant rate of water usage over the past 10 years. The City of Frisco is currently amending their comprehensive plan to reduce the amonut of future industrial uses in Frisco. Taking these items into account, City Staff decided to use a 10% increase for industrial use every 10 years.
2050	96,109		
2040	89,144		
2030	80,860		
2020	66,299		
2010	45,806		

III. WATER SUPPLY SYSTEM

A. Water Supply Sources

List all current water supply sources and the amounts available with each:

Type	Source	Amount Available (MGD)
Surface water	N/A	
Groundwater	N/A	
Contracts	North Texas Municipal Water District	entire demand
Other	N/A	

B. Treatment and Distribution System

1. Design daily capacity of system:

2. Storage capacity:
   Elevated 5.25 MG
   Ground 26 MG

3. If surface water, do you recycle filter backwash to the head of the plant?
   Yes ___ No ___. If yes, approximately ___ MGD.

4. Please describe the water system. Include the number of treatment plants, wells, and storage tanks. If possible, include a sketch of the system layout.
   Treatment Plants: 0 Storage Tanks: Elevated 1 - .75 mg 1 - 2.0 mg 1 - 2.5 mg
   Wells: 1 inactive Ground 1 - 1 mg 1 - 5 mg 2 - 10 mg

IV. WASTEWATER UTILITY SYSTEM

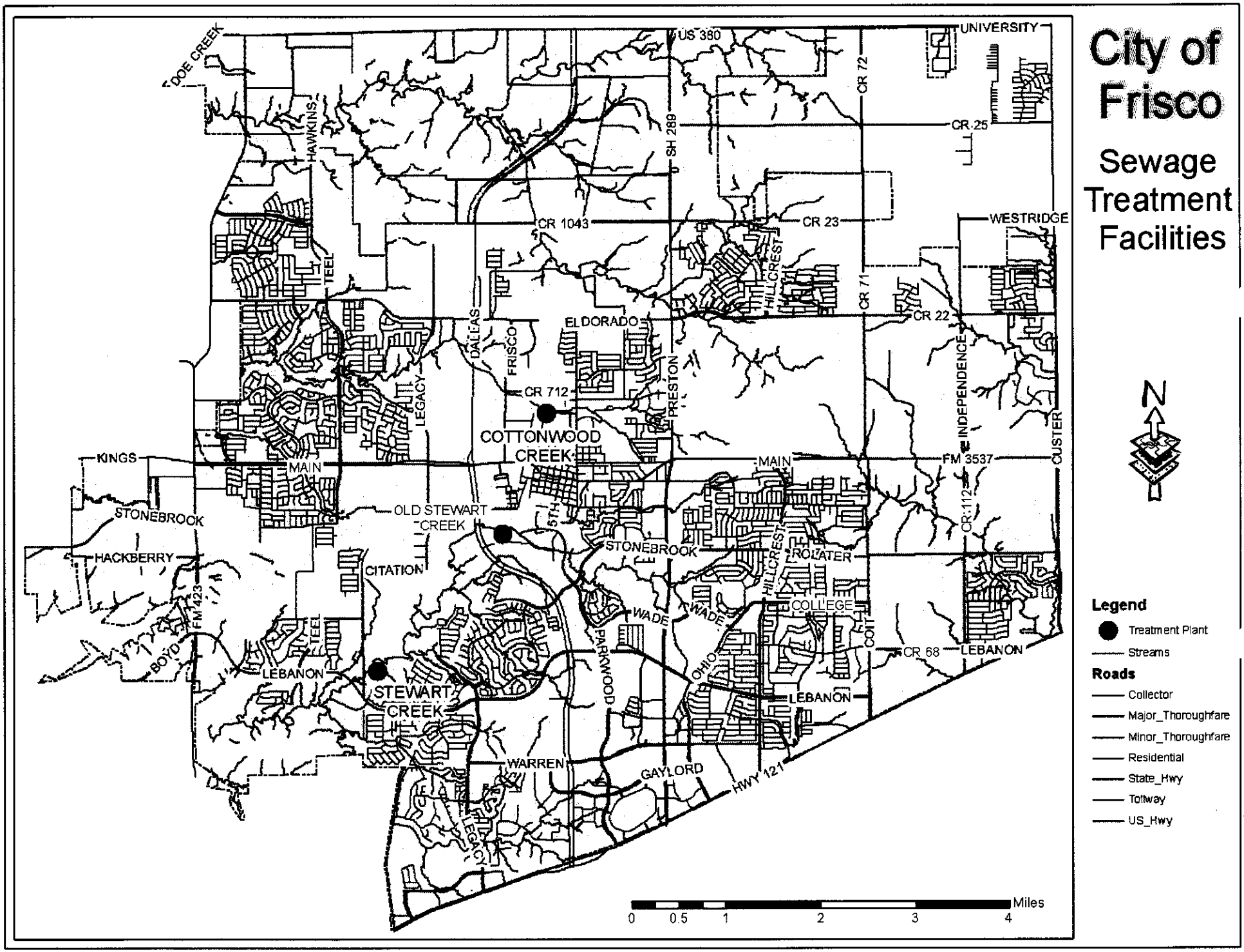
A. Wastewater System Data

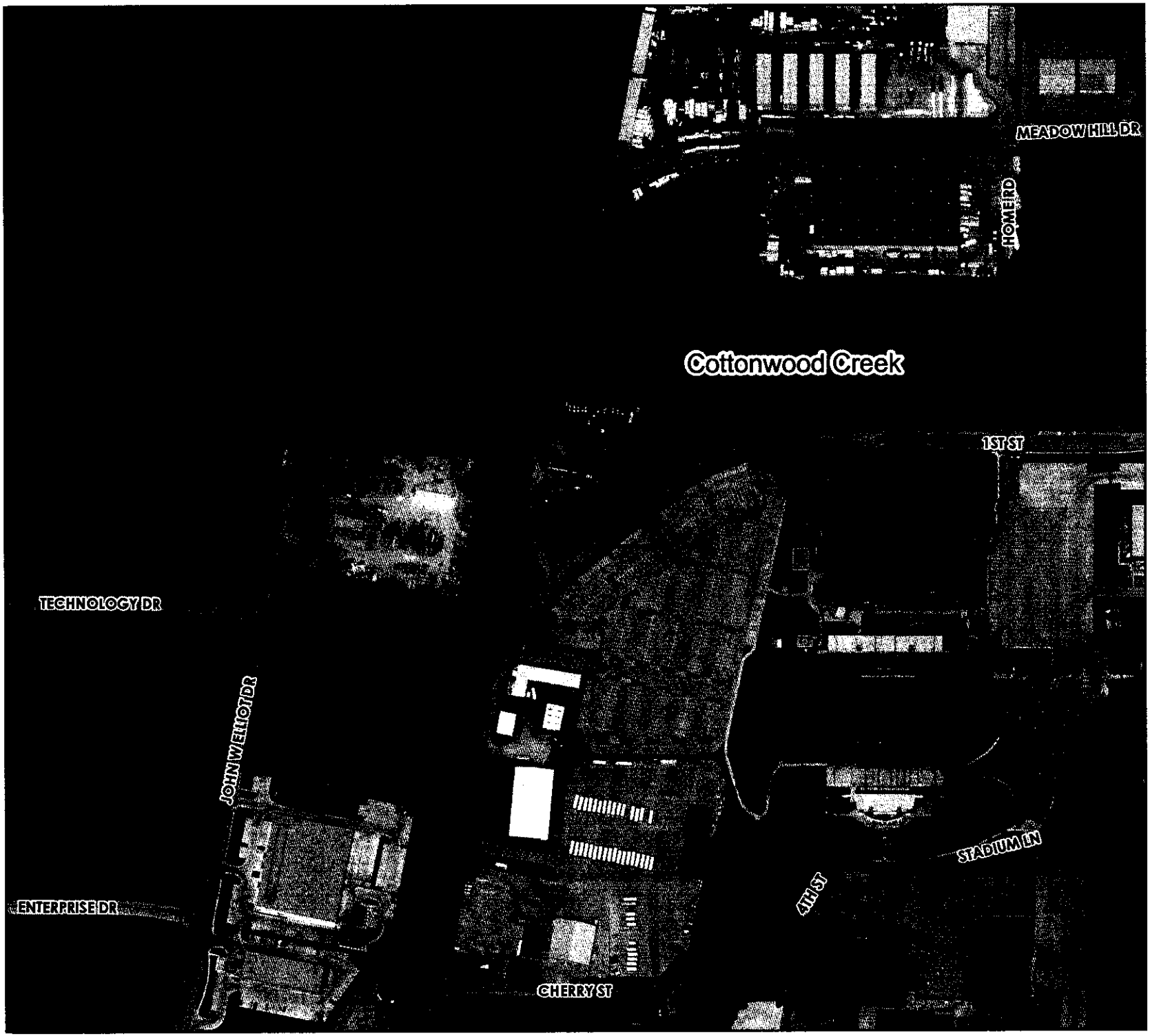
1. Design capacity of wastewater treatment plant(s): 5.3 MGD

2. Is treated effluent used for irrigation on-site ___, off-site X, plant washdown ___, or chlorination/dechlorination ___? If yes, approximately 17.2 million gallons per month. Could this be substituted for potable water now being used in these areas ___?

3. Briefly describe the wastewater system(s) of the area services by the water utility. Describe how treated wastewater is disposed of. Where applicable, identify treatment plant(s) with the TCEQ name and number, the operator, owner, and, if wastewater is discharged, the receiving stream. Please provide a sketch or map which located the plant(s) and discharge or disposal sites.:

Treatment Plant Name	TCEQ Number	Operator	Owner	Receiving Stream
Cottonwood Creek WWTP	TX0027723	NTMWD	City of Frisco	Cottonwood Creek
Stewart Creek West WWTP	TX0103501	NTMWD	NTMWD	Stewart Creek


City of Frisco
Sewage Treatment Facilities
DOE CREEK
US 380
UNIVERSITY
HAWKINS
SH 289
CR 72
CR 25
CR 1043
CR 23
WESTRIDGE
TEEL
DALLAS
FRISCO
HILLCREST
CR 71
CR 22
ELDORADO
LEGACY
PRESTON
INDEPENDENCE
CR 712
COTTONWOOD CREEK
KINGS
MAIN
FM 3537
CUSTER
STONEBROCK
OLD STEWART CREEK
5TH
CR 112
HACKBERRY
CITATION
ROLATER
FM 423
WADE
COLLEGE
BOYD
PARKWOOD
OHIO
COIT
CR 68
LEBANON
STEWART CREEK
WARREN
GAYLORD
HWY 121
LEGACY
N
Legend
Treatment Plant
Streams
Roads
Collector
Major_Thoroughfare
Minor_Thoroughfare
Residential
State_Hwy
Tollway
US_Hwy
0
0.5
1
2
3
4
Miles



City of Frisco

Cottonwood Treatment Facility

N

Legend

Streets

- Residential
- Collector
- Minor Thoroughfare
- Major Thoroughfare
- US Hwy
- State Hwy
- Tollway
- Streams

Feet

0 150 300

City of Frisco

Stewart Treatment Facility

N

Legend

Streets

- Residential
- Collector
- Minor Thoroughfare
- Major Thoroughfare
- US Hwy
- State Hwy
- Tollway
- Streams

Feet

0 150 300


City of Frisco
OLD Stewart Creek Treatment Facility
Dallas Pkwy
GENESIS
CRYSTALLIZER RDWY
N
Legend
Streams
Roads
Collector
Major_Thoroughfare
Minor_Thoroughfare
Residential
State_Hwy
Tollway
US_Hwy
sde.DBO.Railroad
Feet
0 75 150 300

B. Wastewater Data for Service Area

1. Percent of water service area served by wastewater system: 99.30%
2. Monthly wastewater volume for previous three years (in 1,000 gallons):

Year	2003	2002	2001
January	3,190	2,991	3,618
February	3,941	2,470	4,655
March	3,542	3,621	4,600
April	3,204	4,046	2,995
May	3,654	3,421	3,806
June	3,696	2,877	3,785
July	3,444	3,075	2,828
August	3,589	2,841	2,507
September	4,188	2,952	2,795
October	3,355	3,710	2,716
November	3,664	3,203	2,553
December	3,416	3,819	3,102
Total	42,883	39,026	39,960

V. UTILITY OPERATING DATA

A. List (or attach) water and wastewater rates, and rate structures for all classes.
Ordinance Attached

B. Other relevant data: Please indicate other data or information that is relevant to both the applicant's water management operations and design of a water conservation plan.

VI. CONSERVATION GOALS

Please use the data provided in this survey to establish conservation goals (additional data may be used).

A. Water conservation goals for municipal utilities are generally established to maintain or reduce consumption, as measured in:

1. gallons per capita per day used; 200 gpcd
2. unaccounted-for water uses; Less that 12%
3. peak-day to average-day ratio; and/or 3
4. an increase in reuse of recycling or water. 10%

CITY OF FRISCO, TEXAS ORDINANCE NO. 94-07-06

AN ORDINANCE OF THE CITY OF FRISCO, TEXAS, AMENDING ORDINANCES NO. 90-06-01, 91-10-05, 93-10-07 AND 94-04-08; PROVIDING FOR THE PUBLICATION OF THE CAPTION OF THIS ORDINANCE; AND PROVIDING FOR AN EFFECTIVE DATE HEREOF.

WHEREAS, the City Council of the City of Frisco, Texas, has reviewed Ordinance Nos. 90-06-01, 91-10-05, 93-10-07 and 94-04-08 of the City of Frisco, Texas concerning establishing water service charges, sanitary sewer charges, garbage collection charges, late penalty and service disconnection and reconnection fees; providing for deposits for water and sewer; and

WHEREAS, the City Council has investigated and determined that it will be advantageous and beneficial to the City of Frisco, Texas to amend Ordinance No. 94-04-08 as set forth below.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FRISCO, TEXAS:

Section 1. Section I, " Water Service Charges", of Ordinance No. 94-04-08, of Frisco, Texas, is hereby amended to read as follows:

There shall be charged and collected each month by the City of Frisco, Texas from the consumers of water service the amount of money hereinafter set out, based upon the following rates:

A. The minimum monthly bill for residential customers shall be $9.77 for the first 2,000 gallons, $2.28 per thousand gallon for each thousand gallons of water to 15,000 gallons, and $2.98 for each thousand gallons of water or fraction thereof used above that included in the minimum bill (2,000 gallons).

B. The minimum monthly charge for commercial customers shall be based on the meter size and shall be billed at the following rates which include the cost of

2,000 gallons of water:

i. For a 3/4" standard meter, water service shall be $10.18 per month.

ii. For a 1" meter, water service shall be $15.12 per month.

iii. For a 1 1/2" meter, water service shall be $30.25 per month.

iv. For a 2" meter, water service shall be $48.12 per month.

v. For a 3" meter, water service shall be $89.37 per month.

vi. For a 4" meter, water service shall be $137.50 per month.

vii. For a 6" meter, water service shall be $288.75 per month.

C. For larger consumption, the rate shall be billed as follows: $2.38 per thousand gallons for each thousand gallons of water or fraction thereof used above that included in the minimum bill (2,000 gallons).

D. For multi-family units on master meters, a minimum of $8.75 per unit will be charged, with $2.38 per thousand gallons for each thousand gallons of water or fraction thereof used above the total number of units multiplied by 2,000 gallons.

E. Outside City limit rate for all rate classes shall be: Multiplied by a factor of 1.5 for both the minimum monthly meter service and the rate for larger consumption.

Section VI, of Ordinance No. 94-04-08, of the City of Frisco, Texas is hereby amended to read as follows:

H. A fee of $10.00 shall apply to customers requesting transfer of water service to a new address.

All provisions of Ordinance No. 94-04-08, as originally passed or previously amended, and not amended above shall remain in full force.

Section 2. This Ordinance shall be effective August 1, 1994. If any Section, Subsection, Paragraph, sentence, phrase or clause of this Ordinance shall be declared invalid for any reason whatsoever, such decision shall not affect the remaining portions of this Ordinance which shall

remain in full force and effect; and to this end, the provisions of this Ordinance are hereby declared to be severable.

Section 3. The caption of this Ordinance shall be published in accordance with the law and the Charter of the City of Frisco, Texas and shall be effective for the utility services set forth in the August 15, 1994 - September 14, 1994 City utility bill.

DULY PASSED AND APPROVED by the City Council of the City of Frisco, Texas, on this 5th day of July, 1994.

Robert M. Warren

Robert M. Warren, Mayor

CORRECTLY RECORDED:

Nan Parker

Nan Parker, City Secretary

APPROVED AS TO FORM:

Richard M. Abernathy, City Attorney

DATE OF PUBLICATION, FRISCO ENTERPRISE: 7-22-94; 7-29-94

B. TCEQ/TWDB conservation staff assess the reasonableness of water conservation goals based on whether the applicant addresses the following steps:

1. identification of a water or wastewater problem;
2. completion of the utility profile;
3. selection of goals based on the technical potential to save water as identified in the utility profile; and
4. performance of a cost-benefit analysis of conservation strategies.

If at least the first three steps have been completed and are summarized in the water conservation plan, then staff can conclude that there is substantiated basis for the goals, and that the water conservation plan is integrated into water management. Therefore, the established conservation goals can be deemed reasonable.

C. Complete the following in gallons per capita per day (gpcd) to quantify the water conservation goals for the utility's service area:

1. Estimation of the technical potential for reducing per capita water use (See Appendix C2).

Method	Most Likely Savings 5-Year (gpcd)	Most Likely Savings 10-Year (gpcd)
Reduction in unaccounted-for uses (Appendix C2, Section 4)	0.0	3.8
Reduction in indoor water use due to water-conserving plumbing fixtures (Table C-1)	3.0	5.0
Reduction in seasonal use (Appendix C2, Section 4)	4.6	12.6
Reduction in water use due to public education and rate programs (Appendix C2, Section 4)	5.8	14.0
Total Technical Potential for Reducing per Capita Water Use	13.4	35.4

* Subtract these totals from the dry-year per capita use to calculate the long-run planning goal.

2. Planning Goal

The planning goal equals the dry-year per capita water use minus the total technical potentials calculated in number one above.

	5-Year	10-Year
Planning goal (in gpcd):	287	265
Goal to be achieve by year:	2010	2015

3. Needed reduction in per capita use to meet planning goal (gpcd)

	5-Year	10-Year
Dry-year per capita use:	291	291
Planning goal (from #2 above):	287	265
Difference between current use and goal:	4.4	26.44

(Represents needed reduction in per capita use to meet goal.)

Table C-1

Projected Per Capita Municipal Water Use without Implementation of Water Conservation Measures beyond Those in Effect in 2000 and Goals

Description	Highest Historical		Goals	
			2010	2015
	Year	Per Capita	5-year	10-year
Actual Historical Per Capita Municipal Use	2000	291	X	X
Projected Per Capita Municipal Use without Low-Flow Plumbing Fixtures	X	X	300	300
TWDB Reduction due to Low-Flow Plumbing Fixtures	X	X	3	5
Projected Per Capita Municipal Use with Low-Flow Plumbing Fixtures	X	X	297	295
Other Projected Reductions Due to this Plan	X	X	10.4	30.4
Water Conservation Goals with this Plan	X	X	286.6	264.6

APPENDIX C1
Definitions of Utility Profile Terms

1. **Residential** sales should include residential sales to residential class customers only.
   Industrial sales should include manufacturing and other heavy industry.
   Commercial sales should include all retail businesses, offices, hospitals, etc.
   Wholesale sales should include water sold to another utility for a resale to the public for human consumption.

2. **Unaccounted-for water** is the difference between water diverted or treated (as reported in Section IIIA1) and water delivered (sold) as reported in Section IIA2). Unaccounted-for water can result from:
   1. inaccurate or incomplete record keeping;
   2. meter error;
   3. unmetered uses such as firefighting, line flushing, and water for public buildings and water treatment plants;
   4. leaks; and
   5. water theft and unauthorized use.

3. The **peak-day to average day ratio** is calculated by dividing the maximum daily pumpage (in million gallons per day) by the average daily pumpage. Average daily pumpage is the total pumpage for the year (as reported in Section IIA1) divided by 365 and expressed in million gallons per day.

4. **Municipal per capita use** is defined as total annual municipal water use divided by the population and 365 days. Total municipal water use is calculated by subtracting the **industrial sales** and **wholesale sales** from the total water diverted or treated (as reported in Section IIA1)

   Total municipal water use = total water diverted or treated - industrial sales - wholesale sales
   Municipal per capita use (gpcd) = total municipal water use/population/365

   Note: The AWWA considers the municipal per capita use as the most representative figure to use in long-range water supply and conservation planning.

5. **Seasonal water use** is the difference between base (winter) daily per capita use and summer daily per capita use. To calculate the **base daily per capita use**, average the monthly diversions for December, January, and February, and divide this average by 30. Then divide this figure by the population. To calculate the **summer daily per capita use**, average the months of June, July, and August, and divide the average by 31. Then dvide the summer value by the population.

APPENDIX C2
Estimating the Technical Potential for Reducing Per Capita Water Use

The technical potential for reducing per capita water use is the range in potential water savings that can be achieved by implementing specific water conservation measures. The lower end of the range represents the potential savings under a "most likely," or real-world conservation scenario. The top of the range represents the potential savings under an "advanced" conservation scenario. The conservation measures include:

reducing unaccounted-for water uses;
reducing indoor water use due to water-conserving plumbing fixtures;
reducing seasonal water use; and
reducing water use through public education programs.

Guidelines and examples for calculating the technical potential water savings for each of these conservation measures are given below.

I. Reducing Unaccounted-For Water Uses

The TCEQ considers unaccounted-for water uses of 15% or less as acceptable for communities serving more than 5,000 people. Smaller, older systems or systems that have a larger service area may legitimately experience larger losses. Losses above 15% may be an area of concern, and provide a conservation potential.

The bottom of the range for technical potential savings for unaccounted-for uses is zero. To calculate the top of the range, see the following example:

Example:

Unaccounted-for uses =	19.50%	(App C, II.A.3)
Dry-year per capita water use =	250 gpcd	(App C, II.A.5)
Potential for reduction in unaccounted-for use		
= (250 gpcd x 19.5%) - (250 gpcd x 15%)		
= 48.75 gpcd - 37.5 gpcd		
= 11.25 gpcd		
Technical Potential Savings Range = 0 to 11.25 gpcd		

Computation for Frisco:

Unaccounted-for uses =	16.30%	(App C, II.A.3)
Dry-year per capita water use =	291 gpcd	(App C, II.A.5)
Potential for reduction in unaccounted-for use		
= 3.78		
Technical Potential Savings Range = 0 to 3.78 gpcd		

II. Reducing Indoor Water Use due to Water-Conserving Plumbing Fixtures

The Texas Water Development Board (TWDB) recently completed a water conservation study that estimated that the average savings of replacing higher water-use fixtures with more efficient fixtures mandated by state and federal laws would be 16 gallons per person per day (10.5 gpcd for toilets and 5.5 gpcd for showerheads). The TWDB used 1995 as their benchmark for determining the potential average per-capita water savings of an entity. The 1995 population was assumed to have less-efficient water fixtures. No additional water savings can be expected in the basis of fixture replacement for the population growth after 1995. By 1995, retailers were assumed to have sold off their remaining stock of high water use plumbing fixtures. The annual rate of replacement was estimated to be 2% of the 1995 population.

The TWDB estimated the water savings due to low-flow plumbing fixture replacements as follows:

PCS2000 = (((POP1995 x 10%) + G1995-00) / POP2000) x 16 gpcd

where:

GPCD2000	Per person, per day in the Year 2000 (gpcd)
G1995-00	Population growth between 1995 and 2000
PCS2000	The entity's average gpcd savings due to plumbing code changes (fixture replacement) between 1995 and 2000
PCS2010	The entity's average gpcd savings in 2010 due to plumbing code changes (fixture replacement) in the previous 10 years
POP1995	July 1995 population estimate
POP2000	Census 2000 population (cities) or Year 2000 population estimate
POP2010 - POP2060	Population projections for the entity in the decades 2010 through 2060

The additional savings by decade can be calculated as follows:

PCS2010 = [((POP1995 x 30%) + (POP2010 - POP1995)) / POP2010 x 16 gpcd] - PCS2000

GPCD2010 = GPCD2000 - PCS2010

Notes: The 30% represents 2% x the number of years (2010-1995). These formulas work through 2040. By 2050, all of the fixture replacements would have taken place and no additional savings would occur.

The TWDB reductions are included in Table C-1.

III. Reducing Seasonal Water Use

The Texas Water development Board (TWDB) has calculated seasonal use as a percentage of average annual per capita use for East Texas (20%), West Texas (25%), and a statewide average of 22.5%. Seasonal water use is calculated by multiplying the average annual per capita use in gpcd by the appropriate percentage.

Based on the TWDB methodology, the technical potential for reduction in seasonal use is then calculated by multiplying the seasonal use by 7% for the "most likely" conservation scenario, and by 20% for the "advanced" scenario. Below is an example calculation:

Example:

Average annual dry-year per capita use =	185 gpcd		
Geographical location =	West Texas		
Seasonal use =	(185 gpcd x 25%) =	46.25 gpcd	
Potential reduction in seasonal use (Most Likely scenario) =		(46.25 x 7%) =	3.24 gpcd
Potential reduction in seasonal use (Advanced scenario) = (46.25 x 20%) =			9.25 gpcd
Technical Potential Savings Range = 3.24 to 9.25 gpcd			

Computation for Frisco:

Average annual per capita use =	281 gpcd		
Geographical location =	North Texas		
Seasonal use =	63.14 gpcd	(see Appendix C II.A.6)	
Potential reduction in seasonal use (Most Likely scenario) =			4.42 gpcd
Potential reduction in seasonal use (Advanced scenario) =			12.63 gpcd
Technical Potential Savings Range = 4.42 to 12.63 gpcd			

IV. Reducing Water Use through Public Education and Water Rates Programs

The technical potential for water conservation from public education and wate rates programs is estimated to be from 2% of the average annual per capita use for the "most likely" conservation scenario to 5% for the "advanced" scenario, according to the "Water Conservation Guidebook," published in 1993 by the American Water Works Association. Below is an example calculation:

Example:

Average annual per capita use =	185 gpcd	
Potential reduction in water use (Most Likely scenario) = (185 x 2%) =		3.70 gpcd
Potential reduction in water use (Advanced scenario) = (185 x 5%) =		9.25 gpcd
Technical Potential Savings Range = 3.7 to 9.25 gpcd		

Computation for Frisco:

Average annual per capita use =	281 gpcd	
Potential reduction in water use (Most Likely scenario) = (185 x 2%) =		5.61 gpcd
Potential reduction in water use (Advanced scenario) = (185 x 5%) =		14.03 gpcd
Technical Potential Savings Range = 5.61 to 14.03 gpcd		

To calculate the total technical potential for reducing municipal per capita water use, simply add the individual technical potential amounts calculated in items I-IV above. In this case the total technical potential range equals 6.94 gpcd to 29.75 gpcd

Example Summary of Technical Potential Calculations

Conservation Measure	Calculation Procedure	Example Result
Reducing unaccounted-for uses	(Dry year demand) x (Unacc.-for percentage if more than 15%, minus 15%)	0 to 11.25 gpcd
Reducing indoor water use due to water-efficient plumbing fixtures	Reduction expected according to TWDB	Included in Table C-1 separately.
Reducing seasonal water use	Seasonal use (Avg. use x 22.5%) x 7% and 20%	3.24 to 9.25 gpcd
Reducing water use through public education and water rates programs	Average use x 2% and 5%	3.7 to 9.25 gpcd
	Total Technical Potential Savings	6.94 to 29.75 gpcd

Summary of Technical Potential Calculations for Frisco

Conservation Measure	Calculation Procedure	Result
Reducing unaccounted-for uses	(Dry year demand) x (Unacc.-for percentage if more than 15%, minus 15%)	0 to 3.78
Reducing indoor water use due to water-efficient plumbing fixtures	Reduction expected according to TWDB	Included in Table C-1 separately.
Reducing seasonal water use	Seasonal use (Avg. use x 22.5%) x 7% and 20%	4.42 to 12.63
Reducing water use through public education and water rates programs	Average use x 2% and 5%	5.61 to 14.03
	Total Technical Potential Savings	13.03 to 35.44

To calculate the long-run planning goal, subtract these totals from the dry-year water demand.

Example:

Long-run planning goal = (dry year water demand with low-flow fixtures) minus (total technical potential)
= 250 gpcd - 6.94 gpcd = 243 gpcd ("most likely" scenario)
= 250 gpcd - 29.75 gpcd = 220 gpcd ("advanced" scenario)
Long-run planning goal for municipal water use = 243 gpcd to 220 gpcd

Computation for Frisco:

Long-run planning goal = (dry year water demand with low-flow fixtures) minus (total technical potential)

5-year:	278	("most likely" scenario)	10-year:	278	("most likely" scenario)
	256	("advanced" scenario)		256	("advanced" scenario)

APPENDIX D

WATER CONSERVATION REPORT*

*To be completed every March once the Plan is adopted.

APPENDIX E

LANDSCAPE WATER MANAGEMENT REGULATIONS

APPENDIX E

Landscape Water Management Regulations

A. Purpose

The purpose of these landscape water management regulations is to provide a consistent mechanism for preventing the waste of water resources.

B. Lawn and Landscape Irrigation Restrictions

1. A person commits an offense if the person irrigates, waters, or knowingly or recklessly causes or allows the irrigation or watering of any lawn or landscape located on any property owned, leased, or managed by the person between the hours of 5:00 a.m. and 8:00 a.m. and between 10:00 a.m. and 6:00 p.m. from June 1 through September 30 of any year. Systems on well water, reuse or reclaimed water are exempt from these restrictions.

2. A person commits an offense if the person knowingly or recklessly irrigates, waters, or causes or allows the irrigation or watering of lawn or landscape located on any property owned, leased, or managed by that person in such a manner that causes:

   a. over-watering lawn or landscape, such that a constant stream of water overflows from the lawn or landscape onto a street or other drainage area; or

   b. irrigating lawn or landscape during any form of precipitation. This restriction applies to all forms of irrigation, including automatic sprinkler systems; or

   c. irrigating lawn or landscape when the temperature reaches 40 degrees or below. This restriction applies to all forms of irrigation, including automatic sprinkler systems; or

   d. the irrigation of impervious surfaces or other non-irrigated areas, wind driven water drift taken into consideration.

3. A person commits an offense if the person knowingly or recklessly operates a lawn or irrigation system or device on property that the person owns, leases, or manages that:

   a. has broken or missing sprinkler head(s); or

   b. has not been properly maintained to prevent the waste of water.

C. Rain and Freeze Sensors

1. Any new irrigation system installed on or after June 1, 2005, must be equipped with rain and freeze sensing devices in compliance with state design and installation regulations.

2. A person commits an offense on property owned, leased or managed if the person:

   a. knowingly or recklessly installs or allows the installation of new irrigation systems in violation of Subsection C.1; or

   b. knowingly or recklessly operates or allows the operation of an irrigation system that does not comply with Subsection C.1.

   c. fails to repair or replace a broken or missing rain/freeze sensor within 30 days.

D. Pressure Regulating Devices

1. Any new irrigation system installed on or after June 1, 2005, must be equipped with one or any combination of the following devices:

   a. each zone must be equipped with a pressure regulating valve; or

   b. the entire system must utilize pressure regulating nozzles; or

   c. the entire system must utilize pressure regulating spray heads and/or rotors.

   All devices must be in compliance with state design and installation regulations.

E. Modifications

1. In special cases, modifications to the requirements of this Appendix E may be granted by the Director of Public Works, or his/her designee, to persons demonstrating extreme hardship or need. Modifications may be granted under the following circumstances:

   a. the applicant must sign a compliance agreement agreeing to irrigate or water the lawn and/or landscape only in the amount and manner permitted by the approved modification; and

   b. the modification must not cause an immediate significant reduction to the water supply; and

   c. the extreme hardship or need requiring the modification must relate to the health, safety, or welfare of the person making the request; and

d. the health, safety, and welfare of the public and the person making the request must not be adversely affected by the requested modification.

2. An approved modification will be revoked by the Director of Public Works, or his/her designee, upon a finding that:

   a. the applicant can no longer demonstrate extreme hardship or need; or

   b. the terms of the compliance agreement are violated; or

   c. the health, safety, or welfare of the public or other persons requires revocation.